

Claims

1. A method of processing an array of electronic components comprising the steps of providing mounting means mounting unsingulated electronic components onto the mounting means, singulating the components to physically separate them, and testing the singulated electronic components for defects whilst they are mounted on the mounting means and without removal therefrom.

2. A method according to claim 1, further comprising the step of marking a surface of each electronic component after testing and whilst it is still mounted on the mounting means.

3. A method according to claim 2, wherein the singulation, testing and marking steps are carried out at two or more stations.

4. A method according to claim 3, including the step of moving the electronic components at least between the testing and marking positions for testing and marking respectively.

5. A method according to claim 1, which includes the step of detecting the alignments of electronic components before testing, and orientating the array of electronic components as desired before implementing testing.

6. A method according to claim 2, wherein the surface of each electronic component is marked with a laser device which generates a laser beam, for effecting marking.

7. A method according to claim 6, wherein the mounting means comprises a film of laser transparent tape with an adhesive on one surface, wherein each electronic component is mounted on the adhesive surface of the film of transparent tape, and wherein marking is effected by the laser device on a

surface of each electronic component attached to the adhesive surface of the tape.

5 8. An apparatus for processing an unsingulated array of electronic components comprising:

- a mounting means for mounting electronic components;
- a singulating device for singulating the said array of electronic components; and
- a testing device for testing each of the said components for defects;

10 whereby singulation and testing of electronic components are conducted while they are mounted on the mounting means without removal therefrom.

15 9. An apparatus according to claim 8, including an inscribing device for marking each of the electronic components while they are mounted on the mounting means.

10. An apparatus according to claim 9, wherein the singulation, testing and marking are carried out at two or more stations of the apparatus.

20 11. An apparatus according to claim 10, including means for moving the electronic components for processing at least between the testing and marking positions.

25 12. An apparatus according to claim 11, wherein the moving means is adapted to move the electronic components in linear and rotary axes, such as an XYZ-Theta table.

30 13. An apparatus according to claim 8, wherein the mounting means comprises a film of material having an adhesive on one side and stretched on a support frame, whereby electronic components are mountable on the adhesive side.

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14. An apparatus according to claim 13, wherein there is a vacuum chuck for holding in position the support frame and film on which electronic components are mountable, during the singulation, testing and marking.

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15. An apparatus according to claim 8, including an orientating device to adjust alignment of electronic components and/or to locate the positions of defective components.

16. An apparatus according to claim 15, wherein the orientating device is an image recognition vision system.

17. An apparatus according to claim 9, wherein the inscribing device is a laser device which generates a laser beam to mark a surface of an electronic device by heating said surface.

18. An apparatus according to claim 17, wherein the mounting means comprises a film of transparent tape with an adhesive surface on which electronic components are mountable, and wherein the laser device is adapted to mark a surface of each electronic component that is mounted on said adhesive surface of the transparent tape.

19. An apparatus according to claim 18, including an inverting device to invert the transparent tape to expose the surface of each electronic component that is mounted on said adhesive surface of the transparent tape to the laser device for marking.

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